Uniwell
2004-2-4

LX-5000 series 05 type

LX-5600 2-sheet dot matrix printer
LX-5700 2-sheet thermal printer
LX-5750 1-sheet thermal printer

Interfaces & Peripherals Manual

CAUTION!

When the control key position is LOCK, the display is off and keyboard is disabled but the ECR's power is still **ON**. So that before you connect the cable of peripherals, make sure that the AC cord is disconnected otherwise the ECR will be damaged.

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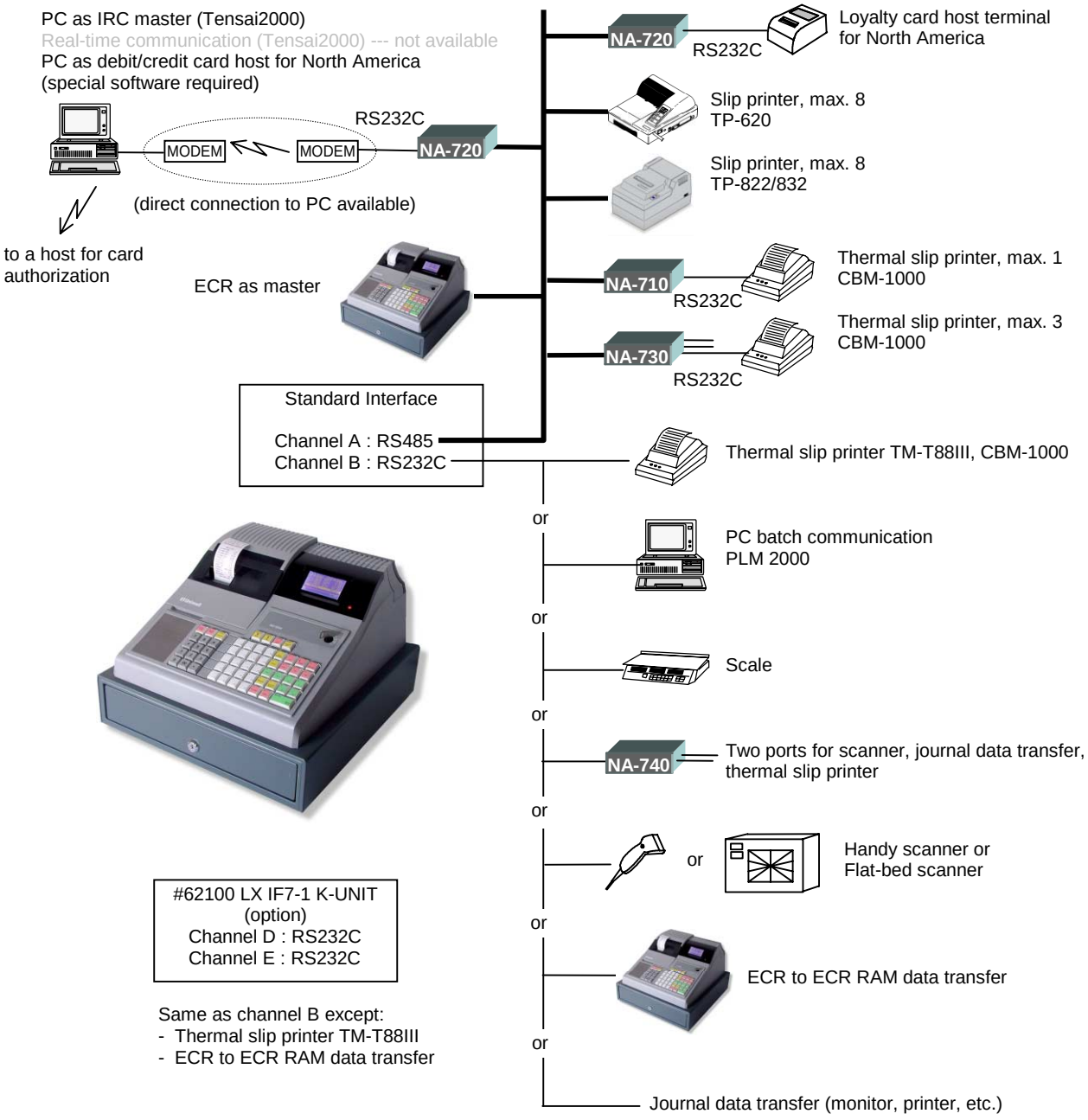
I. INTERFACE INFORMATION

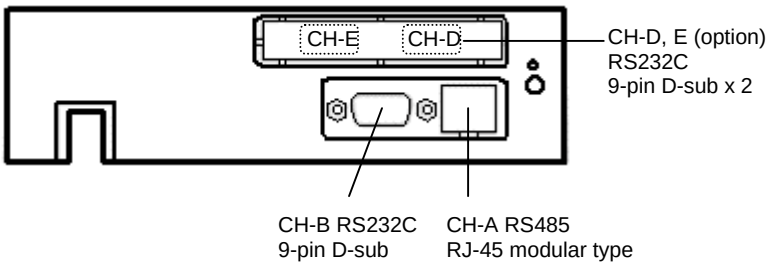
System Configuration

Maximum 32 units can be connected via IRC line including the master, max. 8 slip printers. However, an ECR can use one slip printer.



Interface Information

INTERFACE	Channel		Used for
Standard Interface	A	RS485	**IRC** : up to 32 units including an ECR master or PC as IRC master (Tensai2000) via NA-720 **Real-time communication with PC (Tensai2000)** --- not available **8 slip printers** TP-620 : Epson M290 impact dot matrix printer TP-822 : Citizen DP-416 impact dot matrix printer with auto cutter TP-832 : Citizen LT-1320 thermal printer with auto cutter CBM-1000 : thermal printer with auto cutter (connected via NA-710/730) **Network Adapter** NA-720 for PC as IRC master or for Modem to PC
	B	RS232C	One of : - PC batch communication, Programming Loader Module PLM 2000 including ESF data transfer - Scanner - Scale - Thermal slip printer TM-T88III, CBM-1000 - ECR to ECR RAM data transfer - Journal data transfer (monitor, printer) - NA-740: two ports for scanner, thermal slip printer or journal data transfer
(62100) LX IF7-1 K-UNIT (option)	D	RS232C	Same as channel B
	E	RS232C	(except Thermal slip printer TM-T88III and ECR to ECR RAM data transfer)



Pin Assignment & Character Structures

CHANNEL A

(RS485, RJ-45 modular type connector)

Baud rate : 19200 bps or 38400 bps [SF-89.a]

Character structure : start bit = 1 bit
(fixed) data bit = 8 bits
stop bit = 2 bits
parity = even

PIN #	SIGNAL	FUNCTION
1	DATA+	Comm. data signal (+)
2	DATA-	Comm. data signal (-)
3	CTL+	Comm. line control (+)
4	N.C.	
5	N.C.	
6	CTL-	Comm. line control (-)
7	N.C.	
8	N.C.	

CHANNEL B

(RS232C, 9-pin D-sub female connector)

Block size : 1024 characters for PC batch communication

Baud rate : 600 ~ 38400 bps [SF-94.f~h]
9600 ~ 38400 bps [SF-89.d,e] for ECR to ECR RAM data transfer

Character structure : start bit = 1 bit
data bit = 7 bits or 8 bits [SF-94.b]
stop bit = 1 bit or 2 bits [SF-94.d]
parity = odd, even or null [SF-94.a,c]

PIN #	I/O	SIGNAL	FUNCTION
1		P.GND	Protection ground
2	OUT	TXD	Transmitted data
3	IN	RXD	Received data
4	OUT	RTS	Request to send
5	IN	CTS	Clear to send
6	OUT	+5V	Power supply for handy scanner (max. 200 mA)
7		GND	Signal ground
8	IN	DCD	Data carrier detect
9	OUT	DTR	Data terminal ready

Optional interface board LX IF7-1 K-UNIT : Channels D and E (channel C is not used)

CHANNEL D Same specification as channel B above.
System function [SF-98] is used for the setting of baud rate and character structure.

CHANNEL E Same specification as channel B above.
System function [SF-100] is used for the setting of baud rate and character structure.

II. IRC SYSTEM

The master PC or ECR can transmit programming data to the slave ECRs and collect the sales data from the slave ECRs via channel A.

- PC as Master using PC-IRC communication module Tensai2000 via NA-720
  NA-720 is required between PC and ECR for protocol converter "RS485 to/from RS232C".

- ECR as Master : Any ECR can be a master ECR.
  PC connected to channel B of master ECR, can collect the reports on master ECR and send the program data to master ECR by PC commands.

Preparation

Before using the IRC system, the following presetting must be performed:

a) For new machines being added to the system, perform RAM test SP-9901 to erase all RAM contents. **Do not perform this operation on the machines already used as it will erase all preset data.**

b) Confirm the following three points on each ECR:

1. Each ECR is connected by the IRC line. Refer to VIII. Cable Connection (page 25).

2. ECR machine number (PGM-171)
   The last two digits of the machine number used for ECR ID #, must be **01 ~ 32 out of 62** and different for each ECR.

3. Baud rate of all ECRs [SF-89.a] (PGM-100)

SF-89	1/0	bit	1	0
		a	Baud rate: IRC line (ch-A) is 38400 bps	19200 bps

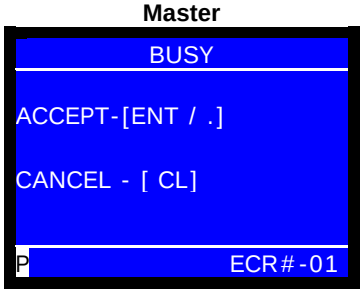
c) IRC status check operation

Either a PC as master or ECR as master, perform SP-8800 IRC STATUS CHECK on ECR as follows:

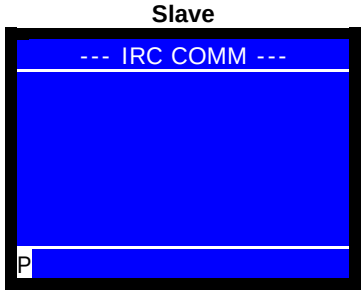
< SP >--(8800)--[X/ENTER]--[• /ENTER] or select IRC PROGRAM and 8800 IRC STATUS CHECK from the list

During SP-8800 IRC STATUS CHECK, the following message is displayed:

Master



Slave



The master ECR will check ECR sequential number up to 8, even when there are fewer ECRs than 8 ECRs on the IRC line.

After IRC status check is completed, all ECR's connected can communicate via IRC line, and the IRC system configuration table is printed as follows:

```
S-8800
 01 #101 OK
 02 #102 OK
 03 #103 OK
#101-000006          19:07P
```

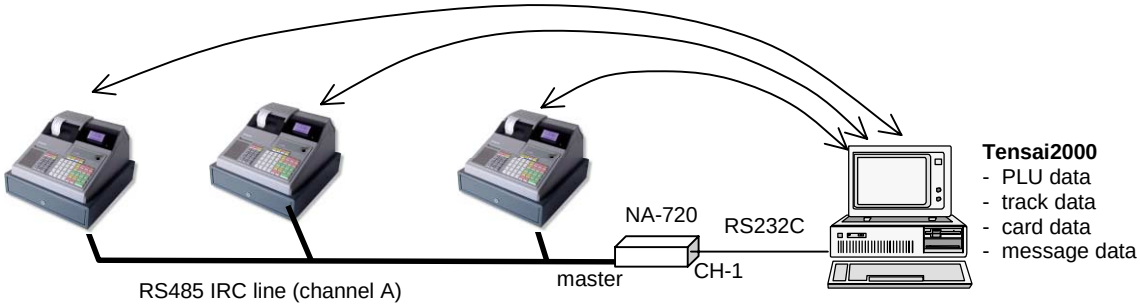
ECR sequential #, machine #, IRC status

If there is a communication error, 'NG' will be printed instead of 'OK'. Retry SP-8800 operation.

For the "Program data transfer from master to slaves", "IRC report" and "IRC messages", please refer to programming manual.

III. REAL-TIME COMMUNICATION --- not available

Real-time communication refers to the instantaneous on-line communication between any ECR and a PC via channel A. The communication software Tensai2000 is required in a PC and data files for PLU, track, card and message must be prepared.



Data Files (file name)	Data referring method by ECR	Sending data by PC
PLU data (PLU.dat)	Enter a PLU on ECR. If the entered PLU does not exist, ECR refers the PLU data file on PC.	PC sends back the PLU data with a classification message.
Track data (track.dat)	Enter a track number on ECR. ECR refers the track data file on PC.	PC sends back the track data with a classification message.
Card data (card.dat)	Press card media key and swipe the card. ECR refers the card data file on PC.	PC sends only a classification message.
Message data (non.dat)	Enter a message by **MESSAGE** key. ECR refers the message data file on PC.	PC sends back the classification message.

PREPARATION

a) Connect the cables between ECR and PC. Refer to Refer to VIII. Cable Connection (page 25).

- Connect ECRs and network adapter NA-720's master channel by IRC line.
- Connect RS232C line between PC and NA-720's CH-1.

b) Confirm the following settings;

- Perform "PC - NA-720 - ECR settings" on PC. Refer to Tensai2000 help.
- Program the followings on each ECR;
  Select the host ID by [SF-82.c~h].
  Select the data file by [SF-4.a~d].
  Set the baud rate of IRC line by [SF-89.a].
  Set the tolerance time limit by [SF-95.b~h].

c) Perform [COMMUNICATION]-[STATUS CHECK] on Tensai2000. This is necessary to communicate with ECRs.

d) Make each data file for the real-time communication by Tensai2000.

- Before you make a data file, perform two steps on Tensai2000;

  1. [COMMUNICATION]-[GET ECR RAM DATA]
  2. [EDIT]-[MAKE UDB FILE]

  These steps are necessary to get the program data in ECR which is required to make a data file for the real-time communication.

- Then, perform [EDIT]-[REALTIME COMM. DATA] to make data files.

IV. PERIPHERALS

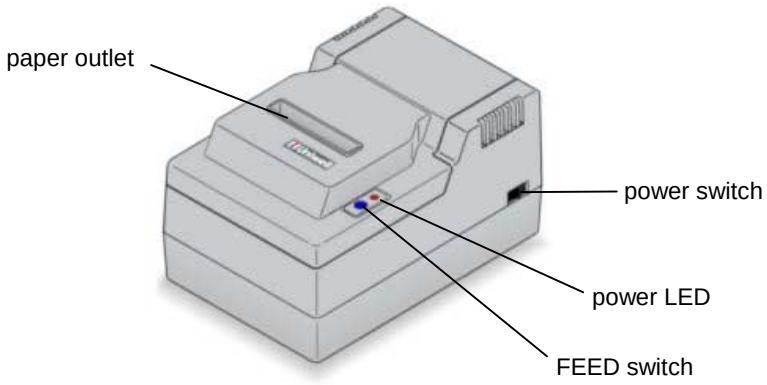
1. SLIP PRINTERS

Refer to VIII. Cable Connection (page 25).

Following printers are available.

Model	Connected to
TP-822/832 (dot/thermal printer, roll paper)	channel A
TP-620 (dot printer, slip paper)	channel A
CBM-1000 (thermal printer, roll paper)	channel A via NA-710/730 channel B
TM-T88III (thermal printer, roll paper)	channel B

1) TP-822/832 (connected to ch-A)



ECR SETTINGS

a) Program the following flags;

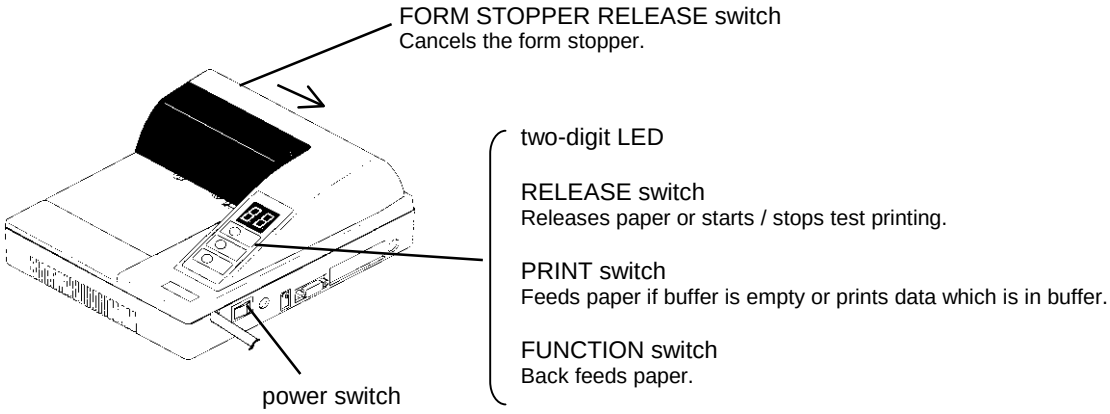
[SF-83.h]	**[1]** with slip printer
[SF-87.a,b]	**[0,1]** slip printer selection : TP-822/832
[SF-88.a,b,c]	slip printed on which printer
[SF-89.a]	baud rate for IRC line: **[1]** 38400 bps, **[0]** 19200 bps The character structure for IRC line has already been fixed on ECR. (1 start bit, 8 data bits, 2 stop bits, even parity)

b) See [SF-83 ~ 87] for other selections, such as time print, logo print, automatic slip print, etc.

TERMINAL PRINTER SETTINGS

Refer to TP-800 SERIES TERMINAL PRINTER PROGRAMMER'S MANUAL.

2) TP-620 (connected to ch-A)


FORM STOPPER RELEASE switch
Cancels the form stopper.
two-digit LED
RELEASE switch
Releases paper or starts / stops test printing.
PRINT switch
Feeds paper if buffer is empty or prints data which is in buffer.
FUNCTION switch
Back feeds paper.
power switch

ECR SETTINGS

a) Select following;

[SF-83.h]	**[1]** with slip printer
[SF-87.a,b]	**[0,0]** slip printer selection TP-620
[SF-88.a,b,c]	slip printed on which printer
[SF-89.a]	baud rate for IRC line: **[1]** 38400 bps, **[0]** 19200 bps The character structure for IRC line has already been fixed on ECR. (1 start bit, 8 data bits, 2 stop bits, even parity)

b) See [SF-83 ~ 87] for other selections, such as time print, logo print, automatic slip print, etc.

TP-620 SETTINGS

Refer to TERMINAL PRINTER TP-620 USER'S MANUAL.

3) CBM-1000 (connected to ch-A via NA-710/730)

CBM-1000-UW ROM for ECR character must be replaced by the installed standard ROM on the printer.

ECR SETTINGS --- same settings as TP-822/832 (page 8)

NETWORK ADAPTER SETTINGS

NA-710 : 1 printer can be connected
NA-730 : up to 3 printers can be connected

Unplug the cord and set the dip switches as shown below;
Plug the cord to fix the setting.

DIP SW	NA-710/730
SW1 - 1, 2	[OFF,ON] 19200 bps for RS232C (set the same baud rate as printer)
SW1 - 3	Baud rate for RS485 (set the same baud rate as ECR [SF-89.a]): [ON] 38400 bps [OFF] 19200 bps
SW2 - 1	[OFF] printer ID # 1 ~ 4 [ON] printer ID # 5 ~ 8 (also set SW3, SW4)
SW2 - 2 ~ 4	[OFF,OFF,OFF] printer selection CBM-1000
SW3 - 1	[OFF] auto cut at text end
SW3 - 2	[ON] full cut [OFF] partial cut
SW3 - 3, 4	NA-710 / CH-1 of NA-730 [SW2-1=OFF] → [OFF,OFF] ID# 1 [ON,OFF] ID# 2 [OFF,ON] ID# 3 [ON,ON] ID# 4 [SW2-1=ON] → [OFF,OFF] ID# 5 [ON,OFF] ID# 6 [OFF,ON] ID# 7 [ON,ON] ID# 8
SW4 - 1, 2	CH-2 of NA-730 [SW2-1=OFF] → [OFF,OFF] ID# 1 [ON,OFF] ID# 2 [OFF,ON] ID# 3 [ON,ON] ID# 4 [SW2-1=ON] → [OFF,OFF] ID# 5 [ON,OFF] ID# 6 [OFF,ON] ID# 7 [ON,ON] ID# 8
SW4 - 3, 4	CH-3 of NA-730 [SW2-1=OFF] → [OFF,OFF] ID# 1 [ON,OFF] ID# 2 [OFF,ON] ID# 3 [ON,ON] ID# 4 [SW2-1=ON] → [OFF,OFF] ID# 5 [ON,OFF] ID# 6 [OFF,ON] ID# 7 [ON,ON] ID# 8

CBM-1000 SETTING

Turn off the printer power button and set the dip switches as shown below:
Turn on the power button to fix the setting.

DIP SW	CBM-1000	
DS 1 - 1	ON	with auto cutter
DS 1 - 2 ~ 4	OFF,OFF,OFF,OFF	print mode: high-speed, paper width: 80 mm, print columns: 48
DS 1 - 5	ON	CR mode: LF operation
DS 1 - 6	OFF	input buffer: 4K bytes
DS 1 - 7, 8	ON,OFF	print density : standard
DS 2 - 1 ~ 4	all OFF	ECR character set
DS 2 - 5 ~ 8	all OFF	JIS, condition for busy to occur: off-line and reception buffer full
DS 3 - 1 ~ 4	OFF,ON,ON,OFF	8-bit data, even parity, DTR/DSR control
DS 4 - 1 ~ 4	ON,ON,OFF,OFF	19200 bps (RS232C)

4) CBM-1000 (connected to ch-B)

CBM-1000-UW ROM for ECR character must be replaced by the installed standard ROM on the printer.

ECR SETTINGS

a) Program the following;

[SF-83.h]	**[1]** with slip printer
[SF-87.a,b]	slip printer selection: **[11]** CBM-1000
[SF-94.a~d]	**[0111]** even parity, 8-bit data, 2 stop bits for channel B

Baud rate 19200 bps has been fixed for thermal slip printer of channel B.

b) See [SF-83 ~ 87] for other selections, such as time print, logo print, automatic slip print, etc.

CBM-1000 SETTING

DIP SW	CBM-1000	
DS 1 - 1	ON	with auto cutter
DS 1 - 2 ~ 4	OFF,OFF,OFF,OFF	print mode: high-speed, paper width: 80 mm, print columns: 48
DS 1 - 5	ON	CR mode: LF operation
DS 1 - 6	OFF	input buffer: 4K bytes
DS 1 - 7, 8	ON,OFF	print density : standard
DS 2 - 1 ~ 4	all OFF	ECR character set
DS 2 - 5 ~ 8	all OFF	JIS, condition for busy to occur: off-line and reception buffer full
DS 3 - 1 ~ 4	OFF,ON,ON,ON	8-bit data, even parity, XON/XOFF control
DS 4 - 1 ~ 4	ON,ON,OFF,OFF	19200 bps (RS232C)

5) TM-T88III (connected to ch-B)

ECR SETTINGS

a) Program the following;

[SF-83.h] **[1]** with slip printer
[SF-87.a,b] slip printer selection: **[10]** TM-T88III
[SF-94.a~d] **[0111]** even parity, 8-bit data, 2 stop bits for channel B
Baud rate 19200 bps has been fixed for thermal slip printer of channel B.

b) See [SF-83 ~ 87] for other selections, such as time print, logo print, automatic slip print, etc.

TM-T88III SETTINGS

TM-T88III-UW(s) ROM for ECR character must be replaced by the installed standard ROM on the printer.

Turn off the printer power button and set the dip switches as shown below;
Turn on the power button to fix the setting.

DSW 1	CONTENTS	
1	ON	ignores data reception errors
2	OFF	data buffer : 4K bytes
3	ON	XON/XOFF control
4	OFF	8-bit data
5	ON	parity enabled
6	ON	even parity
7	OFF	19200 bps
8	OFF	

DSW 2	CONTENTS	
1	OFF	busy condition : off line or data buffer full
2	OFF	printing density level 2 (standard)
3	OFF	(fixed)
4	OFF	(fixed)
5	OFF	(fixed)
6	OFF	(fixed)
7	OFF	#6 pin reset signal not used
8	OFF	#25 pin reset signal not used

2. SCANNER

Handy scanner models HC66R (BHS-6060/R) and BCH5442-STA supplied by ECR can be used immediately after the scanner cable is connected to channel B.

Refer to VIII. Cable Connection (page 28).

HC66R and BCH5442-STA's factory settings

9600 bps, 7-bit data, even parity, 1 stop bit

ECR SETTINGS

	1/0	bit	1	0
SF-90 SF-92 SF-93		b	**With scanner** [SF-90] ch-B, [SF-92] ch-D, [SF-93] ch-E	without scanner
SF-94 ch-B		a	Character structure: Odd parity	**Even parity**
		b	Character structure: 8-bit data	**7-bit data**
		c	Character structure: Parity permitted	prohibited
SF-98 ch-D		d	Character structure: 2 stop bits	**1 stop bit**
		e		
		f	Baud Rate [f,g,h]:	
SF-100 ch-E		g	[000] 38400 bps; [001] 19200 bps; **[010] 9600 bps**; [011] 4800 bps;	
		h	[100] 2400 bps; [101] 1200 bps; [110] 600 bps; [111] 300 bps (only for ch-D,E)	

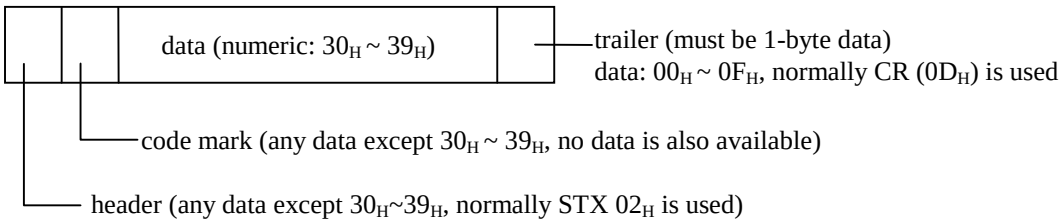
SCANNER SETTINGS

Set following communication settings by a preset bar code menu or a dip switch of scanner to match ECR's setting;

baud rate, data length, stop bit, parity, **RTS/CTS handshake (fixed)**

SCANNER INFORMATION

If scanner's data format is as below, it can be used.


data (numeric: 30_H ~ 39_H)
trailer (must be 1-byte data)
data: 00_H ~ $0F_H$, normally CR ($0D_H$) is used
code mark (any data except 30_H ~ 39_H, no data is also available)
header (any data except 30_H~39_H, normally STX 02_H is used)

Settings for scanner from third party

When you are using BHS-6060 and BCH-5442-STA supplied from third party or a scanner of other manufacturers, some settings are required. Perform the following steps:

1. Connect the scanner to the correct ECR's interface port. RTS signal need to be wired.
   Refer to VIII. Cable Connection (page 28).

2. Set the system function flags of ECR. Refer to the previous page.

3. Set the followings on the scanner by a preset bar code menu or a dip switch of the scanner.
   a. **Message (not text) RTS/CTS handshake** must be set. Some scanner has this fixed.
   b. If there is a selection either "scanner ready" or "data ready", choose "**data ready**".
   c. "Baud rate, data length, stop bit, parity" should be matched to the ECR's settings.
   d. Set the data transmission format of the scanner. Refer to the previous page.

4. Check the scanner works with ECR.

5. If the scanner does not work, the timing of the scanner which deactivates RTS may be fast.
   In order to delay the deactivating timing, increase the trailer (post-amble, terminator) to 2 byte data from 1 byte data. Set "**CR, LF**" for example. Then the scanner will work with ECR.

3. SCALE

A scale which has RS232C interface can be used through channel B or optional channel D of LX IF7-1 K-UNIT.

Recommended models:

DIGI DS-640
BARKEL CX-9, CX-10
Select the scale which matches the scale information described in the following pages.

Refer to VIII. Cable Connection (page 27).

ECR SETTINGS

a) The following system function flags must be programmed;

	1/0	bit	1	0
SF-5		a	Scale interface : W protocol	ICL protocol
		b	Scale type selection [b,c]:	
		c	[00] standard; [01] EC; [10] USA; [11] France	
		e	Weight unit is "kg" ("Kg" for France) up to 9.999 of the manual quantity entry is permitted for standard and EC up to 99.999 is permitted for USA and France	Weight unit is "lb" (99.99)
SF-90 **SF-92** **SF-93**		c	With scale [SF-90] ch-B, [SF-92] ch-D, [SF-93] ch-E	without scale
SF-94 **ch-B** **SF-98** **ch-D** **SF-100** **ch-E**		a	Character structure: Odd parity	Even parity
		b	Character structure: 8-bit data	7-bit data
		c	Character structure: Parity permitted	prohibited
		d	Character structure: 2 stop bits	1 stop bit
		e		
		f	Baud Rate [f,g,h]:	
		g	[000] 38400 bps; [001] 19200 bps; [010] 9600 bps; [011] 4800 bps;	
		h	[100] 2400 bps; [101] 1200 bps; [110] 600 bps; [111] 300 bps (for ch-D,E)	

b) Set following PLU function flags;

	1/0	bit	1	0
PF-1		a	Tare weight entry compulsory **[PF-2.a=1]**	not compulsory
		b	Manual tare weight entry permitted **[PF-2.a=1]**	prohibited
PF-2	**1**	a	**Scaleable item [b=1]**	Non-scaleable item
	1	b	**Decimal number entry permitted**	prohibited

e) Assign **SCALE** key (#222) and **TARE** key (#236) by PGM-101 if required.

SCALE SETTINGS

Set communication settings (baud rate, data length, stop bit, parity) to match the ECR settings above.

1) Scale Information of ICL Protocol [SF-5.a=0]

DATA FORMAT (ICL PROTOCOL)

The format of the data string from the scale is;

STX 02_H	ID	W5	W4	W3	W2	W1	BCC	ETX 03_H

These bytes are defined as follows;

< ID >

ID is an identification byte defining maximum capacity and minimum increments of the scale. Typical capacities and increments are listed below with allocated codes. Further combinations of the codes may be added at the request of scale vendors.

If the weight is under or over the capacity, the weight data of zero (30_H) will be transmitted with bit 4 (X) of the ID byte set to 1.

< W5 ~ W1 >

ASCII code is used for the weight data. In cases where MSD (Most Significant Digit) or LSD (Least Significant Digit) are not required, a 'NUL' character will be transmitted in the unused position.

ID (byte)	Maximum Capacity	Minimum Increment		Weight data recognized by ECR
11X1000	25 lb	1/8 oz	→	XX lb XXX/8 oz
11X1001	15 kg	0.005 kg	→	XX.XXX kg
11X1010	30 lb	0.01 lb	→	XX.XX lb (W1 = NUL)
11X1011	6 kg	0.002 kg	→	X.XXX kg (W5 = NUL)
11X1100	50 lb	0.01 lb	→	XX.XX lb (W4 = NUL)

Weight Data (byte)	
W5 (MSD)	tens of lbs or kgs
W4	units of lbs or kgs
W3	tens of ozs or tenths of kg/lbs
W2	unit of ozs or hundredths of kg/lbs
W1 (LSD)	eighths of ozs or thousandths of kg

For example, when the "15kg" capacity is used and the weight is 2.345 kg, the data will be;

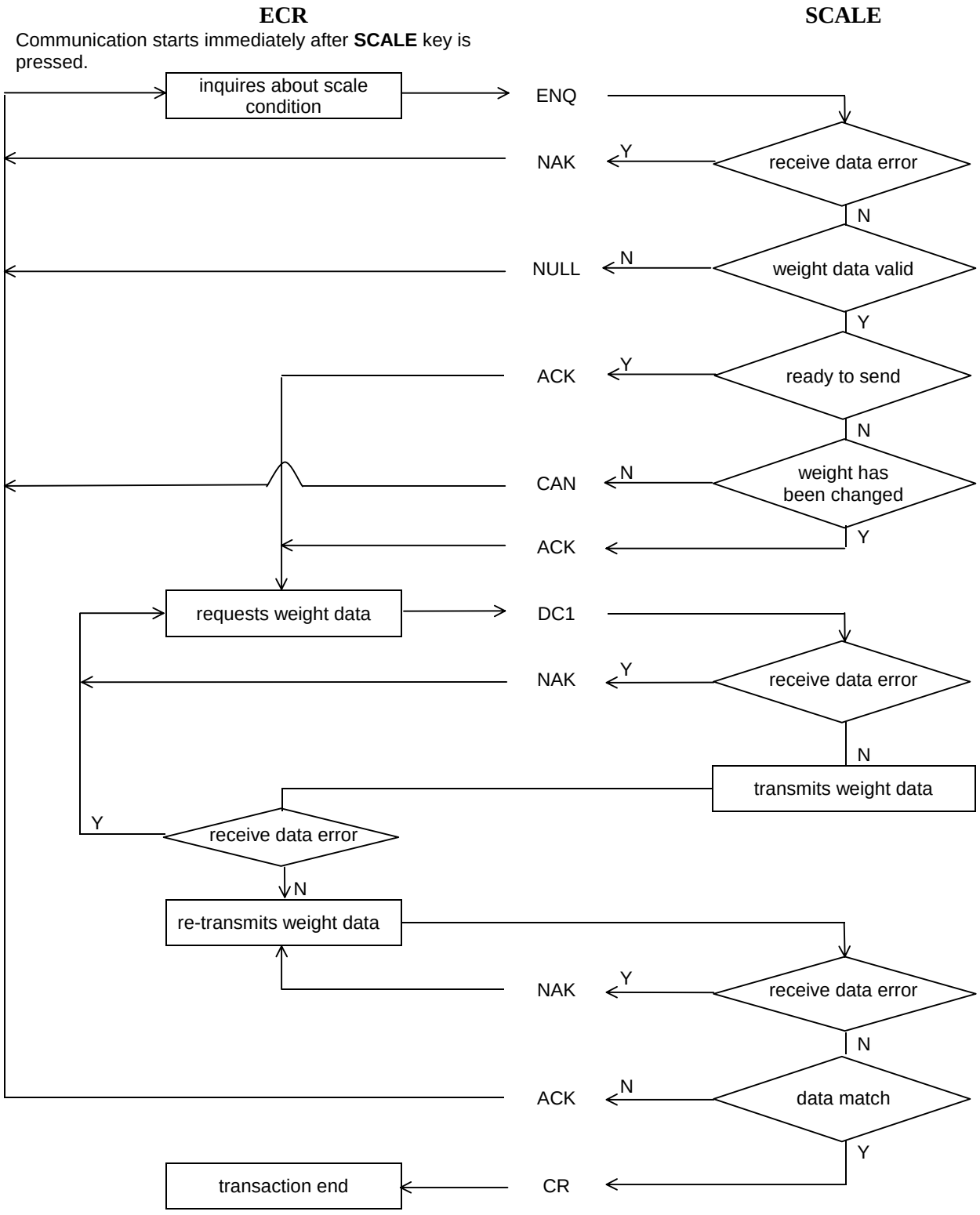
STX 02_H	ID	NUL 00_H	2 32_H	3 33_H	4 34_H	5 35_H	BCC	ETX 03_H

Then, the ECR recognizes the data as "2.345" kg.

< BCC >

Block Check Character is calculated as the even column parity of all characters except the STX and ETX.

ICL PROTOCOL



2) Scale Information of W Protocol [SF-5.a=1]

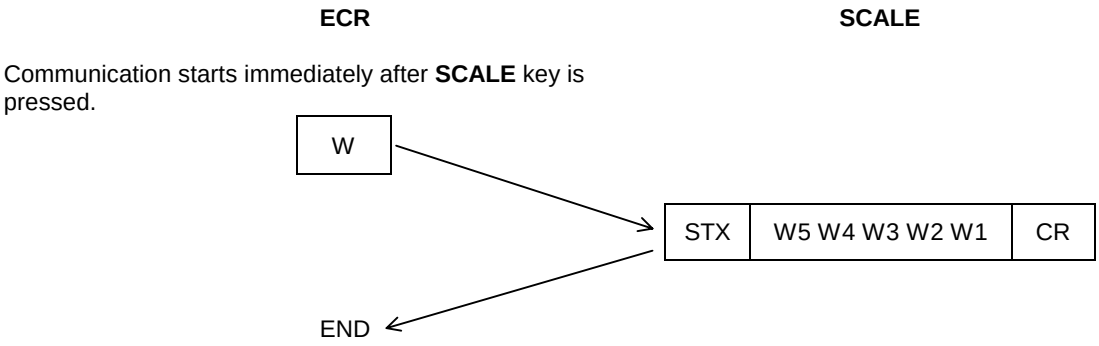
DATA FORMAT (W PROTOCOL)

The format of the data string from the scale is;

STX 02_H	W5	W4	W3	W2	W1	CR $0D_H$

Weight data recognized by ECR	
kg [SF-5.e=1]	XX.XXX kg
lb [SF-5.e=0]	XX.XX lb (W5 = NUL)

W PROTOCOL



V. PC COMMUNICATION

Following functions can be done with a PC through either **one of** channel B;

Refer to VIII. Cable Connection (page 28).

1. BATCH COMMUNICATION

For details about PC batch communication, refer to the PROTOCOL MANUAL UCP-101 and a separate appendix.

REMOTE MEMORY CHANGE

By remote memory change, PC can modify the memory contents of ECR. This function consists of the following three types;

a) Memory Change
Alters ECR's memory contents, by designating the memory address.

b) Memory Management
Alters the contents of PLU, Group, Cashier, R.PLU, Quantity discount tables, % rate, Foreign currency exchange rate and Adjustment rates.

c) Date/Time Change
Sets the date and time from PC.

REMOTE MEMORY DUMP

By remote memory dump, PC can read the memory contents of ECR.

a) X/Z Report Dump
The X/Z report dump is similar to X/Z report of ECR. Using this function, PC can collect or reset individual ECR's data.

b) Consolidated X/Z Report Dump from Master ECR

c) Complete Memory Dump
Collects ECR's complete memory data from PC. This is used mainly for making a back-up file of ECR memory on PC.

COMMAND TRANSFER

A PC orders to a master ECR to consolidate and download data by a command which is connected to master ECR via channel B (RS232C). When master ECR receives a command from PC, master ECR performs the following jobs using IRC line;

a) Programming Transfer
All programming, Rates, PLUs, Groups, R.PLUs, Quantity discount tables, Cashiers, PLU pending price file and PLU lock/unlock file.

b) IRC Report
Auto full transaction, Hourly, Grand total 1, Cash in drawer, Cashier, Groups, PLU, PLU stock, Track (not consolidated), R.PLU and Quantity discount.

c) IRC Flash Report
Transaction, Grand total 1, Cash in drawer, Cashier, Groups, PLU, PLU stock. These flash 'read only' reports can be issued anytime on the master only in the X key position.

2. PROGRAM LOADER (PLM 2000)

Using the software Program Loader Module PLM 2000, ECR's data can be uploaded / edited on PC and restored to ECR.

3. ESF DATA TRANSFER (Electronic Store & Forward)

All registrations or only the selected transaction data by PGM-181 which have been performed only in the **R position** are recorded in the ESF memory (1st optional RAM board). System function flag "ESF function available" [SF-4.h=1] must be selected.

When the 1st optional RAM board for ESF is first installed, X-79 report must be taken to clear in the Z1/P key lock position on ECR.

ESF DATA TRANSFER

The journal data in the ESF memory can be transmitted to PC by remote memory dump (#79) using PC batch communication.

PC ESF remote memory dump (ESF data transmitted to PC)

Using batch communication (RS232C)
PC can take all the stored journal data and the ESF status in ECR by using a command (X79/Z79). When Z79 is taken by PC, all the stored journal data and the ESF status data will be cleared. X79 does not clear the data.

Using PC-IRC function (RS485)
PC as the IRC master can take all the stored journal data and the ESF status in one ECR using a command (X79/Z79). The consolidation function is not available. When Z79 is taken by PC, all the stored journal data and the ESF status data will be cleared.

ECR ESF status check report (ESF data not transmitted to the PC)

Only the ESF status (number of used records, remaining records and total number of records) is printed. The stored journal data will not be printed. When the report is issued in the Z1/P position, all the stored journal data and the ESF status data will be cleared.

CATEGORY CODE AND DATA FORMAT

CATEGORY CODE	CONTENTS	DATA FORMAT
6001	No Sale	no sale amount (fixed to zero)
6003	Customer File	phone # or VAT # / last access date

Not Found PLU & External PLU

6010	Non-Taxable	PLU code / unit price / quantity / quantity discount or lot quantity Note 1: The lot quantity is appeared instead of the quantity discount amount when the PLU has been registered by a split pricing operation. Note 2: If a communication error occurs during the quantity discount data transmission, the data will have an asterisk '*' symbol on the right side of quantity discount amount.
6011	Taxable 1 (VAT 1)	
6012	Taxable 2 (VAT 2)	
6013	Taxable 1 & 2 (VAT 3)	
6014	Taxable 3 (VAT 4)	
6015	Taxable 1 & 3 (VAT 5)	
6016	Taxable 2 & 3 (VAT 6)	
6017	Taxable 1, 2 & 3 (VAT 7)	
6018	Food Stamp Non-Taxable	
6019	Food Stamp Taxable 1	
601A	Food Stamp Taxable 2	
601B	Food Stamp Taxable 1 & 2	
601C	Food Stamp Taxable 3	
601D	Food Stamp Taxable 1 & 3	
601E	Food Stamp Taxable 2 & 3	
601F	Food Stamp Taxable 1, 2 & 3	

PLU

6020	PLU Non-Taxable	PLU code / unit price / quantity / amount / quantity discount or lot quantity / link supplementary message Note: The lot quantity is appeared instead of the quantity discount amount when the PLU has been registered by a split pricing operation.
6021	PLU Taxable 1 (VAT 1)	
6022	PLU Taxable 2 (VAT 2)	
6023	PLU Taxable 1 & 2 (VAT 3)	
6024	PLU Taxable 3 (VAT 4)	
6025	PLU Taxable 1 & 3 (VAT 5)	
6026	PLU Taxable 2 & 3 (VAT 6)	
6027	PLU Taxable 1, 2 & 3 (VAT 7)	
6028	PLU Food Stamp Non-Taxable	
6029	PLU Food Stamp Taxable 1	
602A	PLU Food Stamp Taxable 2	
602B	PLU Food Stamp Taxable 1 & 2	
602C	PLU Food Stamp Taxable 3	
602D	PLU Food Stamp Taxable 1 & 3	
602E	PLU Food Stamp Taxable 2 & 3	
602F	PLU Food Stamp Taxable 1, 2 & 3	

Media

6030	Direct Closing Media	media number (*) / amount
6031	Tendering Amount Entered Media	
6032	P/O Media	
6033	R/A Media	
6036	Change Media	
6037	Cheque-Cashing/Currency Exchange	media number (*) / tendering amount / cashing rate / amount
6038	Direct Closing by Card	media number (*) / amount / card number
6039	Tendering Closing by Card	

R. PLU

6040	R.PLU Non-Taxable	R.PLU number / unit price / quantity / amount / deposit amount / deposit count / return amount / return count
6041	R.PLU Taxable 1 (VAT 1)	
6042	R.PLU Taxable 2 (VAT 2)	
6043	R.PLU Taxable 1 & 2 (VAT 3)	
6044	R.PLU Taxable 3 (VAT 4)	
6045	R.PLU Taxable 1 & 3 (VAT 5)	
6046	R.PLU Taxable 2 & 3 (VAT 6)	
6047	R.PLU Taxable 1, 2 & 3 (VAT 7)	
6048	R.PLU Food Stamp Non-Taxable	
6049	R.PLU Food Stamp Taxable 1	
604A	R.PLU Food Stamp Taxable 2	
604B	R.PLU Food Stamp Taxable 1 & 2	

604C 604D 604E 604F	R.PLU Food Stamp Taxable 3 R.PLU Food Stamp Taxable 1 & 3 R.PLU Food Stamp Taxable 2 & 3 R.PLU Food Stamp Taxable 1, 2 & 3	

Amount

6060 6061	Subtotal Due Amount	amount [SF-54.e=0] media number (*) / local amount / Euro amount [SF-54.e=1]
6062 6065 6066 6067	Net Subtotal Current Charge Storage Food Stamp Subtotal	amount
606C	Short Amount	media number (*) / local amount / Euro amount [SF-54.e=1]
607D 607E 6091 6092	P/O Total R/A Total Item Discount Subtotal Discount	amount

%

60A0 60A1	% on Subtotal % on Item	% key number / amount / rate
60A8 60A9 60AA 60AB	Adjustment 1 Adjustment 2 Adjustment 3 Adjustment 4	subtotal amount / adjustment rate / amount

Tax

60B1	Taxable Subtotal	tax number / amount
60B2	Euro Taxable Subtotal	tax number / amount [SF-54.e=1]
60C0	Tax Total	amount
60C1	Tax Amount	tax number / amount
60C2	Tax Exemption	tax number / amount
60C3	Euro Tax Total	amount [SF-54.e=1]
60C4	Euro Tax Amount	tax number / amount [SF-54.e=1]

Others

60D2	Sales Quantity	number of quantity
60D9	Track Number	track number / amount [SF-54.e=0] track number / local amount / Euro amount [SF-54.e=1, 64.f=0]
60E2	Message	message (max. 20 characters)
60F1	Last Line Data	machine # / cashier # / consecutive # / date / time / store # / customer #
60F2 60F3	Cashier Log-In Cashier Log-Out	cashier # / date / time
60FF	ESF Status Data	number of used records / total records
E11 E12 E13	Z1 Report Count Z2 Report Count X Report Count	count
E21 E31	Consecutive # Machine #	number
E51	Date/Time	date / time

Note (*): Media Number 10~25 corresponds to A~P.

VI. ECR TO ECR RAM DATA TRANSFER

ECR to ECR RAM data transfer is done by using channel B.

This transfer will send the programming data and sales data. If only the programming data is required, reset the sales data by issuing all Z-reports, then follow the sequence below.

PREPARATION

a) Set the same baud rate for both ECRs by [SF-89.d,e].
[SF-89.d,e] **[00]** 38400 bps, **[01]** 19200 bps, **[10]** 9600 bps

b) Connect the ECR to another ECR by using channel B.
Refer to VIII. Cable Connection (page 29).

RAM DATA TRANSFER

1) **On ECR B**, perform the sequence below. Check that "--- PC-IN ---" is displayed.

< SP >--{(1002)--[X/ENTER] or select 1002 COMM LOAD from the list}--[X/ENTER]

2) **On ECR A**, perform the sequence below.
"--- PC-OUT ---" is displayed during the communication.

< SP >--{(1001)--[X/ENTER] or select 1001 COMM DUMP from the list}--[X/ENTER]

VII. JOURNAL DATA TRANSFER

The journal data is transmitted to a peripheral device through channel B, D or E of LX IF7-1 K-UNIT. Refer to VIII. Cable Connection (page 29).

ECR SETTINGS

a) Set the following flags on ECR and the peripheral device to match ECR's communication below:

	1/0	bit	1	0
SF-90 SF-92 SF-93		d	With journal data transfer [SF-90] ch-B, [SF-92] ch-D, [SF-93] ch-E	without journal data transfer
SF-94 ch-B SF-98 ch-D SF-100 ch-E		a	Character structure: Odd parity	Even parity
		b	Character structure: 8-bit data	7-bit data
		c	Character structure: Parity permitted	prohibited
		d	Character structure: 2 stop bits	1 stop bit
		f	Baud Rate [f,g,h]:	
		g	[000] 38400 bps; [001] 19200 bps; [010] 9600 bps; [011] 4800 bps;	
		h	[100] 2400 bps; [101] 1200 bps; [110] 600 bps; [111] 300 bps (only for ch-D,E)	

b) Set [SF-95, 99, 101, 107] for tolerance time limit and transfer compulsory.

PERIPHERAL DEVICE SETTINGS

Set peripheral device to match ECR's communication condition above.

Data Format

journal data 24 digits	C R	L F

Transmitted Character

CODE	0	1	2	3	4	5	6	7	8	9
0			Space	0	@	P	Space	p		
1				1	A	Q	a	q		
2				2	B	R	b	r		
3			#	3	C	S	c	s		
4			$	4	D	T	d	t		
5			%	5	E	U	e	u		
6			&	6	F	V	f	v		
7			'	7	G	W	g	w		
8			£	8	H	X	h	x	□	ä
9			Ñ	9	I	Y	i	y	◊	§
A	LF		*	:	J	Z	j	z		β
B				ϕ	K	Ä	k		=	
C			Å	<	L	Ö	l			
D	CR		-	Σ	M	Ü	m			_
E			.	>	N	Æ	n	→		(
F			/	?	O		o	DW		)

Double-width characters ($7F_H$) are converted to one character code and one space code.

VIII. CABLE CONNECTION

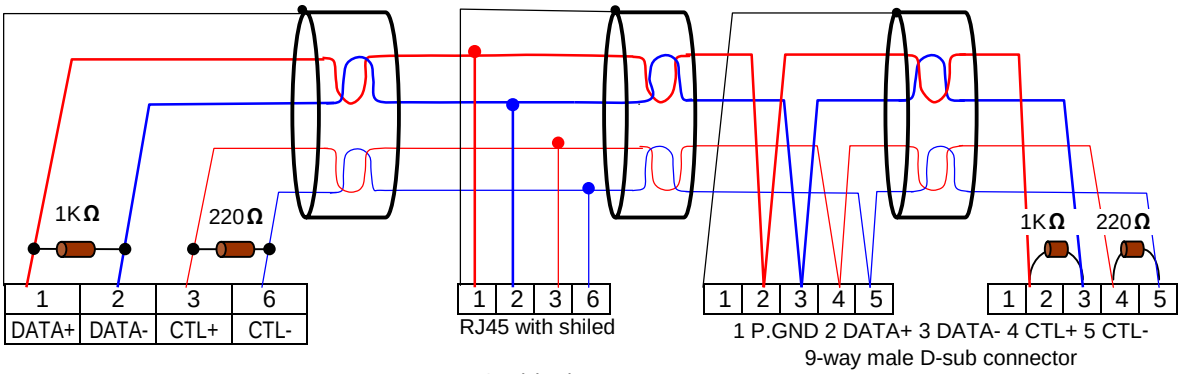
1. CHANNEL A

RJ-45 Modular Type Cable Information
Please use the straight LAN cable (shielded type) which is generally sold.

RS422/485 Shielded Twisted Pair	
Conductor:	AGW24
Characteristic impedance:	< 100 ohms
Capacitance per meter:	40 - 100 pF
Attenuation at 1Mhz / 100m:	2 - 6 db
Cable length:	max. 1200 m
Connectors and Connector Shells:	Ideally use: EMI / RFI Shielding RJ45 type

About Ground
Each ECR must be grounded at the same level and the termination resistors must be fitted on the first and last devices on the line. Please refer to the document "IRC & TERMINAL PRINTER CABLING INSTRUCTION (RS485)" for how to connect cables.

Joint Box
JOINT BOX 485 (REF.# 62092) makes the cable connection simple, quick, and easy between ECRs and Terminal Printers on an IRC line (RS485). Refer to the option instruction manual for details and connection samples.



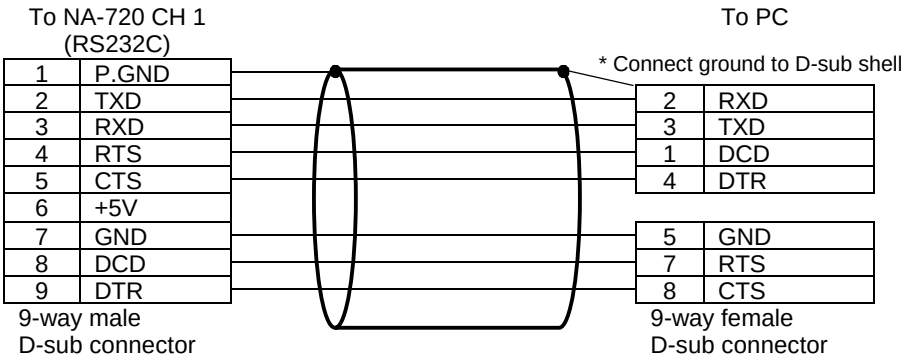
ECR channel A
RJ45 modular type connector with shield

1KΩ termination resistor (1KΩ)
220Ω termination resistor (220Ω)

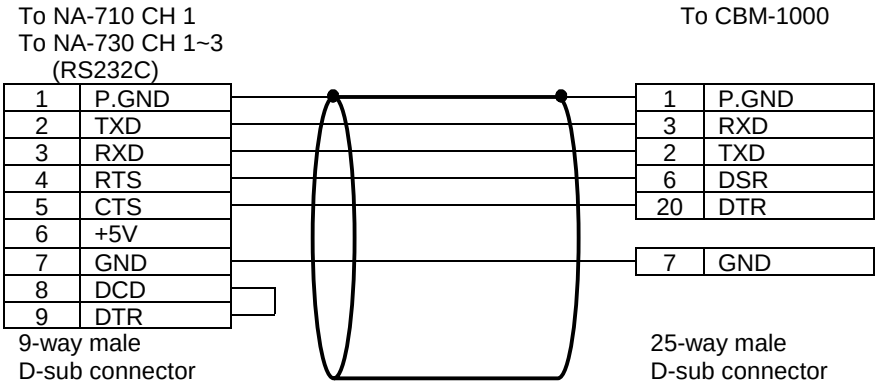
To ECR (ch-A)
To slip printer
TP-822/832 (RJ45)

To slip printer TP-620 (D-sub)
To Network Adapter NA-720 (MASTER)
To Network Adapter NA-710/730 for slip printer CBM-1000

Cable between NA-720 (CH1) and PC

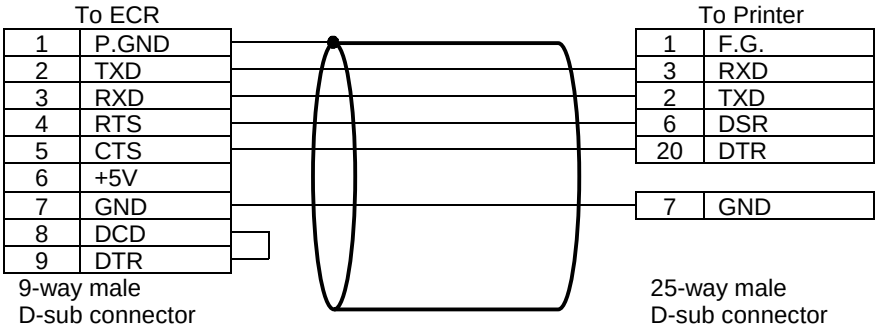


Cable between NA-710/730 and thermal printer(s) CBM-1000

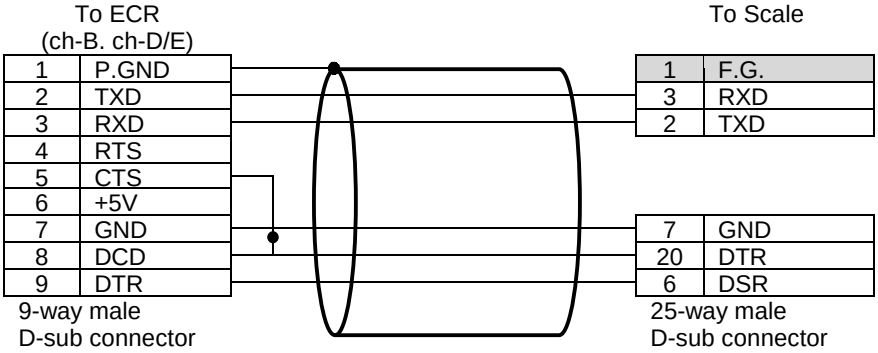


2. CHANNEL B/D/E

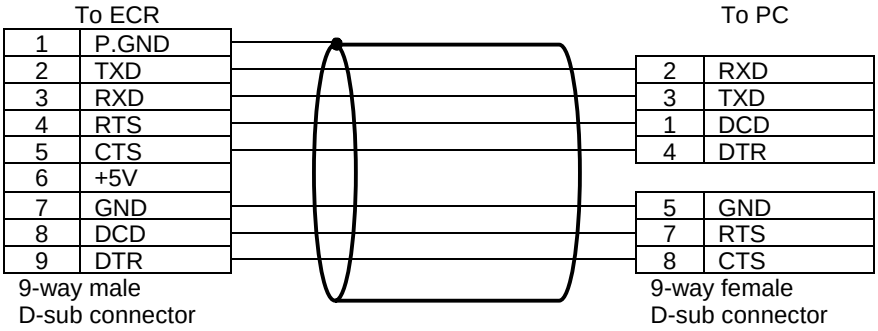
1) ECR (ch-B) to Thermal Slip Printer CBM-1000, TM-T88III



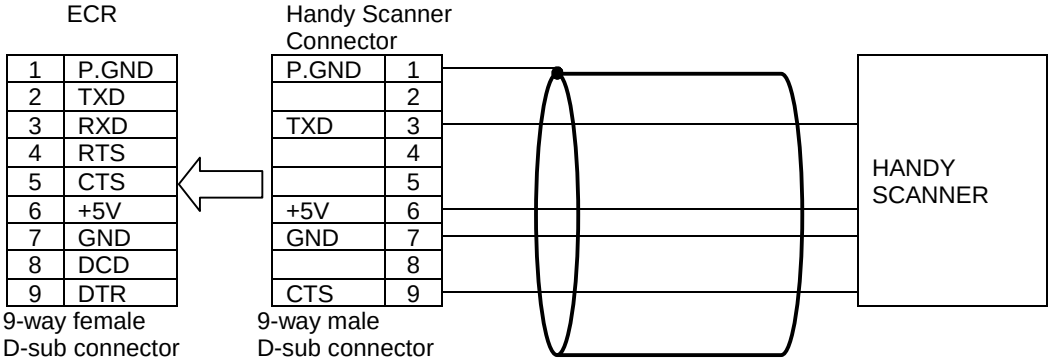
2) ECR (ch-B, ch-D/E) to Scale



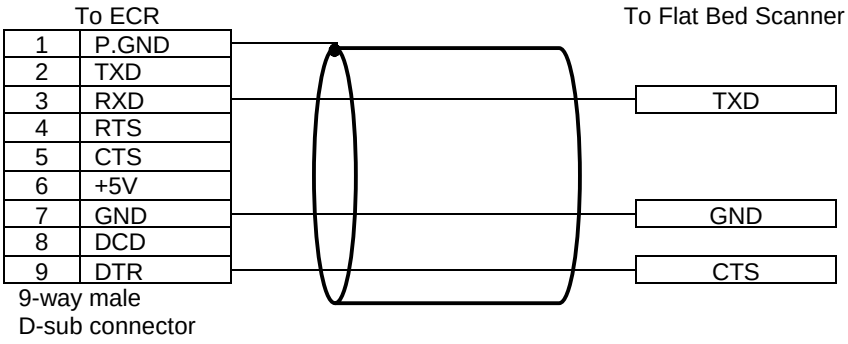
3) ECR (ch-B, ch-D/E) to PC



4) ECR (ch-B, ch-D/E) to Handy Scanner



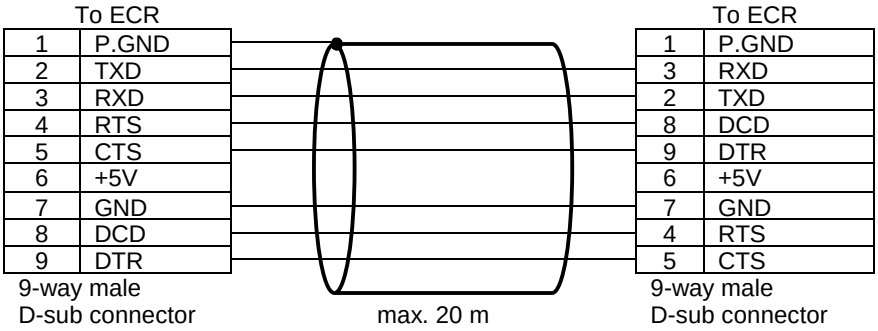
5) ECR (ch-B, ch-D/E) to Flat Bed Scanner



6) ECR (ch-B) to NA-740
for Journal Data Transfer, Handy Scanner and Flat Bed Scanner

Refer to "4, f-3. configuration samples for NA-740" of the separate manual Specifications for Network Adapter NA-700 Series.

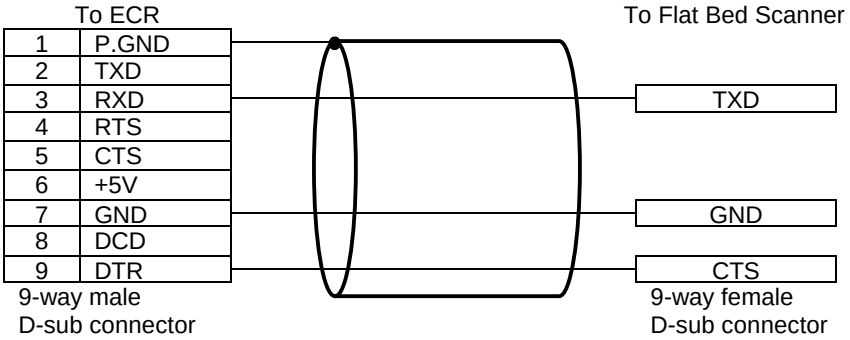
7) ECR (ch-B) to ECR (ch-B) for ECR RAM Data Transfer



8) ECR (ch-B) to NA-740 (MASTER) for Thermal Slip Printer CBM-1000 and PC

Refer to "4, f-1. configuration samples for NA-740" of the separate manual Specifications for Network Adapter NA-700 Series.

9) ECR (ch-B, ch-D/E) to Flat Bed Scanner



10) ECR (ch-B, ch-D/E) to Peripheral for Journal Data Transfer